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| 09/939,711 | 08/28/2001 | Yuuji Tanjo | 50195.269 | 2733 |

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EXAMINER

MERCADO, JULIAN A

ART UNIT PAPER NUMBER

1745

DATE MAILED: 11/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/939,711

Applicant(s)

TANJO ET AL.

Examiner

Julian Mercado

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 39-41 is/are allowed.
- 6) ☐ Claim(s) 19,22,26-31 and 33-36 is/are rejected.
- 7) ☒ Claim(s) 23-25,32,37,38 and 40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Remarks

This Office action is responsive to applicant's amendment filed September 3, 2004.

Claims 19-41 are pending.

Claim Objections

Claim 40 is objected to because of the following informalities:

1. In claim 40 at line 12, "5 am" requires changing to --5 μm --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 20 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 20 recites the limitation "local porosity changed stepwise" in line 2 of the claim. The specification has been reviewed but is not found to support the claimed "stepwise" feature. Applicant's citation of Figures 3 and 4 is acknowledged, however, these figures are

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considered to merely show the more broadly recited porosity changing along the thickness direction.

Claim 21 is rejected under 35 U.S.C. 112, first paragraph as being dependent upon a rejected base claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19, 26-31 and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami et al. (U.S. Pat. 6,432,585 B1) in view of Kohama (JP 11-31498, hereinafter JP '498).

Kawakami et al. has been discussed in detail in the prior Office action and is herein incorporated by reference as previously applied towards claims 1-3, 7-10 and 13-17. (now canceled). With respect to the newly drafted claims, Kawakami et al. is maintained to teach a lithium ion battery comprising a positive electrode [10], a collecting electrode [100], and an active material layer [102]. (col. 9 line 32-42, Figure 1) The active material is, e.g., lithium manganese oxide, with a prescribed particle diameter ranging from 0.5 μm to 60 μm and a prescribed thickness ranging from 10 μm to 100 μm . (col. 9 line 32-42, col. 14 line 18-33, col. 49 line 62 et seq.) The particle size and active material layer thickness is considered to teach the claimed respective ranges to the extent that the disclosed values overlap therewith. As to a

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concentration of electrolyte, Kawakami et al. disclose a concentration of 1 M (mol/L) up to and including 5 mol/l, with the electrolyte itself being LiPF_6 and LiBF_4 . (col. 31 line 19-28, col. 50 line 17-23)

While Kawakami et al. discloses a "void volume" or porosity of 10% to 86%, Kawakami et al. does not explicitly teach this porosity changed along a direction of the layer thickness. However, JP '498 teaches a layer of active material having a porosity thereof changed along its thickness. (Abstract, Figure 1) The specified value of porosity range adjustment is 60 to 70%. The skilled artisan would find obvious to modify Kawakami et al.'s invention by changing the porosity along the thickness direction. The motivation for such a modification would be to increase battery capacity and cycle characteristics. (*ib*)

Claims 19, 22, 26-31 and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami et al. (U.S. Pat. 6,432,585 B1) in view of Wang et al. (U.S. Pat. 6,159,636)

The teachings of Kawakami et al. are discussed above.

In the examiner's view, new claim 22 is modeled after prior dependent claim 11 (now canceled) in that a first and second active material layer is claimed. Kawakami et al. does not explicitly teach a first and second active material layer with respective first and second porosities. However, in the prior Office action, Wang et al. was set forth to teach a second active material layer. (see Wang, col. 4 line 43 et seq.) The skilled artisan would find obvious to employ a second, i.e. plurality of active material layers in Kawakami et al., for reasons such as increasing the specific capacity of the battery cell. (see Wang, col. 15 line 34-38) With respect

to first and second porosities, the prior Office action had also set forth the position that the resulting first and second active material layers would naturally flow to inherently have different particle diameters; the active material layers would therefore have distinct first and second porosities. This ground of rejection is maintained in its entirety for the reasons of record, absent of a showing by applicant that the claimed invention distinguishes over the reference. *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977) and *In re Spada*, 15 USPQ 2d 1655 (Fed. Cir. 1990)

Allowable Subject Matter

Claims 23-25, 37 and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach the first active material closer to the collecting electrode than the second active material, with the porosity of the first active material layer being lower than the porosity of the second active material layer.

Claim 30 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach a first active material formed on the collecting electrode with a porosity in the range of 30% to 50% and a second active material layer formed on the first active material layer with a porosity in the range of 50% to 60%. The range of porosity in the first active material layer is lower than the range of porosity in the second active material layer.

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Claims 39-41 are allowed. Claims 39-41, having been rewritten in independent form, are allowed for the reasons set for in the prior Office action for prior dependent claims 5, 6 and 12. (now canceled)

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

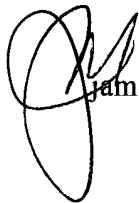
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



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